

stating that "resistant" varieties or "strains" should be grown but in all cases mention the names of such "resistant" varieties obtainable on the market. Such practical information is likely to be of great value to the market grower or gardener; it must be admitted that such assistance as this is not yet able to be given in this country, except in a few cases, by the man of science to the grower.

Throughout the book we find instances given of fungous diseases of different crops which have become epidemic in various districts in the States and caused serious money losses; on the other hand, we have detailed evidence given showing that such losses may often be avoided by careful and thorough spraying with the right fungicide at the right time. The annual loss caused by potato "blight" in the United States is estimated at 36,000,000 dollars; that caused by wheat "rust," 67,000,000 dollars. Turning to horticultural crops, we are told that the violet "leaf-spot" caused, in 1900, a loss of 200,000 dollars; the celery "leaf-spot"—which for the past three seasons has been causing havoc in several counties in this country—is stated to have caused a loss, in California, in 1908, of 1950 car-loads, and a money loss of 550,000 dollars. An interesting account is given of the gradual invasion of the States since 1896 by the asparagus "rust"; it is now known in every State where asparagus is grown—

"In some States the invasion of this disease has almost, if not quite, prohibited commercial asparagus growing. . . . The Palmetto varieties are quite resistant, and offer a solution of the rust problem in some localities."

Of the American gooseberry mildew (which we may remember has, since its introduction into Europe, about 1900, now spread over the whole of Ireland and England) it is said:—

"This disease has quite prohibited the cultivation of the finer sorts of English gooseberries in America, and is a grave menace to the culture of gooseberries in Europe."

One or two points of purely scientific interest may be noted. The statement is made that the pea mildew (*Erysiphe polygoni*) hibernates in seed derived from affected pods, and that the celery "leaf-spot" (*Septoria petroselinii*, var. *Apii*) is probably carried by the seed of celery. The mistake is made of identifying the mildew on cucumber, cantaloupes, and muskmelons with *Erysiphe polygoni*, although Reed's interesting work on the specialisation of parasitism shown by this mildew—which this mycologist correctly referred to *E. Cichoracearum*—was recently published in the States. In place of *Podosphaera* the misprint *Podosphaeria* (with the "popular" (!) name "podosphæriose") appears three times; also the erroneous name of *Sphaerotheca mali* is continued for the apple mildew, and the mistake made of supposing that *Podosphaera leucotricha*—of which *S. mali* is a synonym—is a distinct species.

The book is very well illustrated, and the writing remarkably clear and to the point. There is one touch of pedantry—quite out of place in such a practical book as this—against which a strong protest must be raised—the attempt to create "popular"

names derived from the generic name of the fungus causing the disease. Thus we have "Sphæropose" proposed for "black rot," caused by *Sphaeropsis*, and such verbal monstrosities as "pseudomonose," "lasiodiplose," "meruliose," &c.

A chapter on the legislative regulations—Federal and inter-State—in force in America might have been added to make the admirable thoroughness of this book quite complete. As it is, this book should be in the hands of all the officials—both the Board of Agriculture's inspectors and the inspectors of the various county councils—who are now engaged in England in the work of combating fungous diseases under the provisions of the "Destructive Insects and Pests Act." The importance of the need to create a more enlightened public opinion on matters connected with plant protection and plant sanitation is rightly insisted upon in this book; as its authors say:—"To create a much-needed, enlightened, aggressive public opinion is part of the duty of plant pathology."

E. S. S.

ELEMENTARY MATHEMATICS.

- (1) *A Class Book of Trigonometry*. By Dr. C. Davison. Pp. viii+200. (London: Cambridge University Press, 1910.) Price 3s.
- (2) *The Student's Arithmetic*. By W. M. Baker and A. A. Bourne. Pp. viii+328+1. (London: G. Bell and Sons, Ltd., 1910.) Price 2s. 6d.
- (3) *First-Year Mathematics for Secondary Schools*. By Prof. G. W. Myers and others. Third edition. Pp. xii+365. (Chicago, U.S.A.: University of Chicago Press; London: Cambridge University Press, 1909.) Price 4s. net.
- (4) *Second-Year Mathematics for Secondary Schools*. By Prof. G. W. Myers and others. Pp. xiv+282. (Chicago, U.S.A.: University of Chicago Press; London: Cambridge University Press, 1910.) Price 6s. net.
- (5) *Geometric Exercises for Algebraic Solution. Second-Year Mathematics for Secondary Schools*. By Prof. G. W. Myers and others. Second impression. Pp. ix+71. (Chicago, U.S.A.: University of Chicago Press; London: Cambridge University Press, 1909.) Price 3s. 6d. net.

(1) **T**HE introductory course provided by this text-book includes the solution of triangles, omitting the ambiguous case, applications to the geometry of the triangle and quadrilateral, and easy problems in surveying. Complicated identities are excluded on the ground that they belong to the programme of the specialist rather than the amateur for whose use this is primarily intended. The general character of the book will probably be considered unduly conservative. It fails to take cognisance of the recent movement affecting the teaching of trigonometry. There is scarcely as much numerical work as many teachers will require, and the quality of the problems, which profess to be practical, is distinctly poor. The best feature of the book is the material provided for oral work, which will be found invaluable for class purposes.

(2) This is an abbreviated edition of the "Public School Arithmetic," by the same authors. The number of examples worked out in detail has been materially diminished on the ground that the average boy is apt to rely too much on this form of assistance and so avoids the necessity of thinking for himself. This is, of course, a matter of opinion. It is not at all an easy thing to train students to read for themselves; in general they are far too prone to rely on oral help. In more advanced work, it is unquestionable that there is a real educational value in forcing a boy to find out for himself the meaning of what the text-book is explaining, provided only that the book itself is a good one. Of course, progress is made more slowly in these circumstances, but the substance of what is read is more likely to be digested owing to the increase of mental effort. It is, however, hard to decide at what stage this recourse to books should be encouraged. The present volume gives a very thorough account of all branches of the subject. Indeed, in our opinion it contains far more than it is desirable for the average boy to know. The time required for mastering its contents is so considerable that it will leave small opportunity for proceeding to more fruitful work. But so long as an exhaustive study of the subject is required by examining bodies, it will be necessary for writers to meet this demand. In this the present volume is eminently successful.

(3) and (4) In the opinion of the authors of this treatise, which is issued in two volumes, the subjects of algebra and geometry should be fused together as far as possible. It is suggested that students are more likely to realise the relations which subsist between these two portions of elementary mathematics, if a single text-book is placed in their hands. An examination of the contents of the separate volumes shows that algebra predominates in the first and geometry in the second; but in each case it is true to say that the correlation of the two subjects is kept consistently in view. The first course includes the elements of algebra up to simultaneous linear equations, factors, and fractions, and the fundamental ideas of geometry, viz., congruence, parallelism, and similarity, with numerical illustrations and straightforward constructions. The principle of moments is used to provide some interesting algebraic problems. The advanced course contains a more systematic account of formal geometry, the properties of the circle, theorems on areas and similar figures, the investigation of regular polygons, and more difficult constructions. With this is combined the general solution of the quadratic, the algebraic theory of proportion, graphical algebra, and simple numerical trigonometry restricted mainly to right-angled triangles. The manipulation which is expected from the student is of a simple character. This is probably the best plan for students of the age for which this book is designed. But we doubt whether it is equally desirable to exclude at the same time anything which can be properly called a rider. Numerical work in geometry provides the most certain means of elucidating new ideas, but unless this is combined

with a certain amount of theoretical work, the intrinsic value of the subject is sacrificed. The ability to solve a simple rider is the best index of the intellectual growth of the student.

(5) The title of this book is an adequate description of its contents. It consists of about eight hundred examples, illustrating the theorems of elementary plane and solid geometry, and it yields a collection of questions which many will find a useful supplement to formal treatises.

OUR BOOK SHELF.

Ornitología Argentina. Catálogo sistemático y descriptivo de las Aves de la República Argentina. By Dr. R. Dabbene. Tome Primers. Pp. xiv + 513. (Buenos Aires: Museo Nacional, 1910.)

THE object of the present work, of which the volume before us is only the first, is to provide, as we learn from the preface, a systematic list of all the genera and species of birds inhabiting Argentina, mainly from the point of view of their geographical distribution, for the use, chiefly, of students of ornithology in the Republic. Most of the species common to the neighbouring countries of Brazil, Bolivia, Paraguay, and of the frontiers of Chili and Uruguay are included, since it is highly probable that the birds of these regions will be discovered in the Argentine when it is more fully explored. Included also are all the species inhabiting the archipelagoes and islands lying off the shores, as well as the lands extending southward to the Antarctic circle.

The work is to contain three parts. The first deals with those anatomical characters of birds which are of classificatory value. The second discusses the geographical distribution of the birds of the Republic, with a list in systematic order of all its recent and fossil species, and their assignation to the different zones—shown on a coloured map—into which the author divides the region. The final section, to be dealt with in future volumes, will contain brief diagnoses of the orders and families, &c., of birds represented in the Argentine, with keys for differentiating the species, which number 469, referable to 71 families. An extensive bibliography is appended to each section.

Although Dr. Dabbene is largely indebted, with due acknowledgment, for his morphological facts to European investigators, and among English workers especially to Huxley, Garrod, Forbes, Beddard, Chalmers Mitchell, Garrod, and Newton—from whose works most of his figures are derived, the volume will be of very great value to students so disadvantageously remote from the great European libraries and books of reference, as are those domiciled in Argentina. The section devoted to geographical distribution brings concisely together the data under this head, and will be appreciated by those elsewhere interested in South American ornithology. The volume is provided with very full indices.

Die Samenpflanzen (Blütenpflanzen, Phanerogamen). By Prof. K. Wilhelm. Pp. xvi + 151. (Wien and Leipzig: F. Deuticke, 1910.)

THERE can be no disagreement with the author's opinion that the only satisfactory method of acquiring a knowledge of plant classification is to practise the determination of unknown species with the aid of a flora or other systematic compilation. It has been Dr. Wilhelm's object to supply a compilation suitable for the use of foresters, agricultural, pharmaceutical, and other technical students. The chief essentials for such a work appear to be a differentiation,